

21  
and

Firstly, in order to reset the charges in photo-electric conversion unit 101 are reset at  $t_1$ , a reverse bias voltage  $V_{Hsub}$  is applied to N semiconductor substrate 107 as shown in ~~Figure 2~~, Figures 2, 8 and 9. Hereupon, the charges in photo-electric conversion unit 101 are swept out into N semiconductor substrate 107, because N semiconductor region 109 and P semiconductor region 108 become complete depletion layers.

Next, a voltage  $V_{Bsub}$  is applied to N semiconductor substrate 107 to start storing signal charges corresponding to the incident ~~light~~, light as shown in Figures 2 and 9, while surplus charges which can not be stored in photo-electric conversion unit 101 are excluded into N semiconductor substrate 107 by using vertical OFD for the blooming control.

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**Please rewrite the paragraph on page 8, lines 21-25 as follows:**

2

Then, at the time  $t_3$ , a voltage  $V_{Lsub}$  is applied to N semiconductor substrate 107 to raise up the potential barrier by  $\Delta\phi$  of the vertical OFD for the signal ~~charges~~, charges as shown in Figures 2 and 9, whereby the leakage of the signal charges due to the self-induced drift, or the thermal diffusion is suppressed.

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**Please rewrite the paragraphs beginning on page 8, line 28, and ending on page 9 line 7, as follows:**

2

As shown in Figure 6, ~~The~~ the decrease in the signal charges is improved to the negligible level for practical uses, when  $\Delta\phi$  is greater than 0.4 V, although  $\Delta\phi$  may be more preferably about 0.7 V taking an operation margin into consideration.

a2  
read

The electric potential  $\phi$  is preferably deeper than  $\phi_{tg}$  which is given by the voltage  $V_{Mcl}$  which is applied, during the times except the read-out step, to second charge transfer electrode 106 in signal read-out portion 120 adjacent to photo-electric conversion unit 101 as shown in Figure 12.

Please rewrite the paragraph on page 9, lines 17-23, as follows:

a3

Then, at the time  $t_4$ , signal charges, for example, such as signal charges 11,12,13,31,32,33,51,52,53 in photo-electric conversion unit 101 are read out into vertical charge transfer units 102 which transfer vertically the signal charges line by line into horizontal charge transfer unit 104 which transfers the signal charges horizontally to output them from output circuit 104 as shown in Figure 7.

**IN THE CLAIMS:**

a4  
out

1. (Original) A method for driving a solid-state image pickup device which stores, in a plurality of photo-electric conversion units, signal charges corresponding to an incident light during a prescribed time period, excludes surplus charges by an electric potential barrier, reads out, after cutting off said incident light by a cut-off means such as a mechanical shutter, said signal charges by grouping said photo-electric conversion units into a prescribed number of regions, and outputs image signal from all of the photo-electric conversion units by repeating the read-out procedures, which comprises the steps of:

- cutting off said incident light;
- raising up said electric potential barrier;
- starting out said signal charges.